



# *Mathematics, Engineering, Technology & Science (METS) Alliance*

## *2006 Report to Governor Matt Blunt*

**A Call to Action for Missouri**



## [Table of Contents](#)

<b>Transmittal Letter</b>	<b>Tab 1</b>
<b>Alliance Members</b>	<b>Tab 2</b>
<b>Executive Summary</b>	<b>Tab 3</b>
<b>Missouri METS Alliance Report</b>	<b>Tab 4</b>
<b>Missouri METS Alliance Presenters</b>	<b>Tab 5</b>
<b>Missouri METS Alliance Meetings</b>	<b>Tab 6</b>
<b>Mathematics and Science Curricula Information</b>	<b>Tab 7</b>
<b>Senate Bill No. 580</b>	<b>Tab 8</b>
<b>eMINTS Summary</b>	<b>Tab 9</b>
<b>METS Communications Plan</b> <b>METS Fact Sheet</b>	<b>Tab 10</b>
<b>METS Timeline</b>	<b>Tab 11</b>



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August 31, 2006

The Honorable Matt Blunt  
Office of the Governor  
State of Missouri  
State Capitol  
Room 216  
Jefferson City, MO 65101

Dear Governor Blunt:

The Missouri Math Engineering Technology and Science (METS) Alliance is pleased to submit our plan to implement the strategies/recommendations identified at our April 25<sup>th</sup> Summit. We believe we are providing you with recommendations that will move these issues forward and keep Missouri focused on METS.

On behalf of every member of the Alliance, we would like to express our sincere gratitude to you for your leadership, vision and commitment to improving METS in Missouri. We hope Missouri will become the leader in METS, not only in the United States but the world.

Thank you for the opportunity to address this critical issue and initiate change. We look forward to meeting with you and formally presenting our ideas on September 12<sup>th</sup>.

Sincerely,

A handwritten signature in black ink, appearing to read "Debra", written in a cursive style.

Debra Hollingsworth  
Chair  
Missouri METS Alliance

DH/mw

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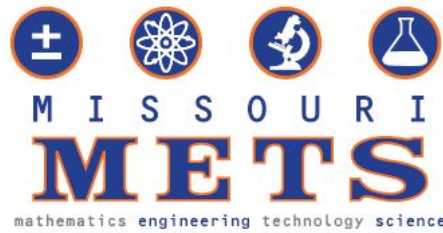
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## EXECUTIVE SUMMARY

The importance of mathematics, engineering, technology and science (METS) to the future well-being of Missouri and the nation was firmly established at Governor Blunt's METS Summit held on April 25, 2006. Post Summit activities include the formation of a METS Alliance and the development of a preschool through graduate level (P-20) action plan organized around five major goals:

- Improve the performance of all P-20 students;
- Expand the pool of students motivated to pursue METS careers;
- Expand the pool of Missouri's P-20 METS educators;
- Establish a technology plan to support METS curricula, Missouri Grade Level Expectations (GLEs) and assessments in Missouri;
- Increase public awareness of the value of METS knowledge on the lives of all Missourians and highlight the importance of METS-related industries and jobs in enhancing Missouri's global competitiveness and innovation.

The METS Alliance created a strategic plan outlining how Missouri could begin to address the needs identified at the Summit. The first step the Alliance took was to recommend establishing a METS Coalition to focus on this crucial statewide priority and increase the likelihood of Missouri's long-term success in executing its METS action plan. The METS Coalition will be comprised of key business, education, and government leaders who will regularly promote, monitor and evaluate the success of Missouri's P-20 METS initiatives. Through broad-based collaboration, the METS Coalition will seek to increase the collective impact of the independent efforts of many individuals and groups.

The METS Alliance addressed each strategic challenge and offered the following recommendations as well as related action plans.

### **STRATEGY 1: Improve the performance of all P-20 students.**

Recommendation 1: Improve METS curricula and assessments. Revise Missouri's K-12 GLEs and assessments for mathematics and science to support focused, inquiry-based instruction modeled on internationally recognized best practices. Ensure that collegiate-level METS curricula follow the same focused, inquiry-based instruction.



Recommendation 2: Increase rigor in collegiate-level courses. Enhance rigor of collegiate-level science and mathematics coursework by expanding Advanced Placement (AP) courses, International Baccalaureate (IB) programs, dual enrollment and dual degree programs offered to secondary students and provide incentives for students completing more rigorous coursework.

### **STRATEGY 2: Expand the pool of students motivated to pursue METS careers.**

Recommendation 1: Improve career education and counseling. Make students aware of METS career opportunities and ensure they have the academic preparation in METS and non-METS curriculum as well as career counseling at all levels of the education system to successfully pursue METS careers.

Recommendation 2: Expose students to “real-world” METS applications. Provide students with exposure to and experience in “real-world” METS applications through partnerships with METS businesses, museums, internships, zoos, labs and other opportunities to learn about METS careers and the prerequisites for pursuing a METS career.

Recommendation 3: Celebrate and reward students who reach certain levels of achievement in METS studies and activities. Provide incentives to motivate students, parents and schools to pursue METS-related higher education programs.

### **STRATEGY 3: Expand the pool of Missouri’s quality P-20 METS educators.**

Recommendation 1: Improve quality and supply of P-20 METS educators. Provide innovative approaches for addressing a mathematics and science trained P-12 teaching shortage, while also developing creative programs with the METS Community Network that will excite current METS teaching professionals.

Recommendation 2: Provide incentives to recruit and retain high-quality P-20 METS educators. Creative incentive programs are needed to encourage high-quality preschool through graduate educators to teach METS courses.

### **STRATEGY 4: Establish a technology plan to support METS curricula, GLEs and assessments in Missouri.**

Recommendation 1: Secure Instructional Technology Facilitators (ITFs) to work with METS educators. Schools need a central point of contact to assist in finding resources needed to bring technology to the classroom and ensure that it is used as an effective tool for teaching.

Recommendation 2: Develop a standard suite of technology and curriculum resources for METS. Students need to have a high level of technology expertise and skills to compete in a global economy. Technology in the classroom improves student learning; therefore, securing these tools is essential.

Recommendation 3: Develop focused professional development to provide all P-20 METS educators with an improved base of teaching methods integrated with age-appropriate content knowledge to engage and motivate students as recommended in the METS strategies. Strong professional development programs with proven results should be used to ensure teachers have technology expertise to maximize teaching effectiveness.

Recommendation 4: Develop and maintain a web based METS portal. Missouri educators need a central web site to find METS resources and best practices.

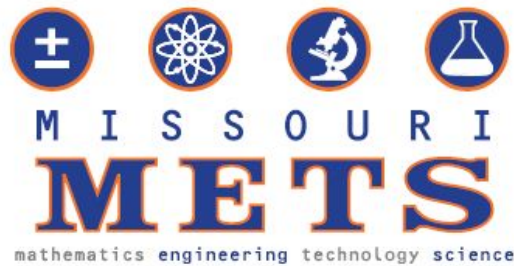
**STRATEGY 5: Increase public awareness of the value of METS knowledge on the lives of all Missourians, and highlight the importance of METS-related industries and jobs to enhance Missouri's global competitiveness and innovation.**

Recommendation 1: Create and implement a public awareness campaign. The METS Coalition will identify and communicate the importance of METS to key stakeholders and develop a long-term strategy to sustain that message.

## **Conclusion**

The METS Alliance members will help prepare the METS Coalition to move these strategies and recommendations forward. By grounding the work of the Coalition in the METS disciplines, Missouri will be responding to the needs of a worldwide competitive workplace and will be directing its scarce resources toward the development and implementation of sound education policies and programs that will meet those needs and result in sustainable change.

The METS Alliance hopes this plan will bring the collaboration of business, industry, education, government and economic leaders to address the issues of preparing students for careers in METS fields. We believe Missouri must think strategically about this issue. We must expend our resources wisely in a coordinated strategy for improving METS education. We believe the elements of this plan are well-designed and will work together to yield real results for Missouri and its citizens.



## Missouri Mathematics, Engineering, Technology and Science Alliance

### Report to Governor Matt Blunt

*“A very real crisis for educators, employers and ultimately all America is the lack of knowledge and motivation in the areas of math and science. This challenge will continue to impede our ability to compete in the global marketplace.”*

Governor Matt Blunt

One word that sums up what will be important in the 21<sup>st</sup> Century is innovation. The development of new technologies, products, and services spur progress in virtually every aspect of life. Innovation holds the key to meeting many of the urgent challenges facing both the nation and the State of Missouri (e.g., skyrocketing health care costs, a looming energy crisis, an aging transportation infrastructure, and a possible flu pandemic).

Forging an accelerated pace of innovation, using technology wisely, and responding effectively to challenges will require not only a deep pool of technical talent but also good policy and an engaged citizenry. A secure future for the state of Missouri and the nation depends heavily on an effective preschool through graduate level (P-20) education system, especially in the areas of mathematics, engineering, technology and science (METS).

To ensure that Missouri succeeds in equipping its citizens with the METS-based knowledge and skills that will be needed to prosper in a global economy, Governor Matt Blunt called 180 business, education and government leaders from around the state to a Missouri Mathematics and Science Summit on April 25, 2006.

This Summit was the first step in the Governor's plan to make Missouri a leader in mathematics and science known for our knowledge, expertise and a workforce well equipped to compete in the global marketplace. As a result of the Summit, five strategic

challenges have been identified that are central to improving METS education in Missouri:

1. Improve the performance of preschool through graduate (P-20) students;
2. Expand the pool of students motivated to pursue METS careers;
3. Expand the pool of Missouri's P-12 METS educators;
4. Establish a technology plan to support METS curricula, Grade Level Expectations (GLEs) and assessments in Missouri;
5. Increase public awareness of the value of METS knowledge on the lives of all Missourians and highlight the importance of METS related industries and jobs to enhance Missouri's competitiveness and innovation.

Governor Blunt provided momentum by establishing and charging a METS Alliance to develop an action plan that would address these strategic challenges and report back to him by August 31, 2006. The Alliance had an ambitious charge and timetable for delivering a plan to make Missouri a global leader in METS.

The METS Alliance membership includes leaders from K-12 and post-secondary education, as well as from business and other civic organizations. The METS Alliance reviewed the results of the Summit, followed the instructions from Governor Blunt and then developed recommendations to move Missouri into the forefront of all states addressing these issues.

Early in the Alliance's deliberations it became clear that ensuring a quality technological infrastructure is critical to the success of learning environments. The METS Alliance decided to add an additional strategy to specifically address this challenge. Therefore, a technology strategy with its own action plan is included in this report.

The METS Alliance also determined that a prerequisite to ensure sustainability of Missouri's METS initiatives would be the formation of a formal coalition to ensure a focus on METS education as a statewide priority. The Missouri METS Coalition (The METS Coalition) will be comprised of key business, education, and government leaders and will promote, monitor and evaluate the success of Missouri's P-20 METS initiatives. The main objective of the METS Coalition will be to facilitate broad-based collaboration with government, business, education, philanthropy and non-profit institutions to address the many facets of this complex issue. The METS Coalition will be focused on a statewide agenda with an emphasis on systemic reform of the entire P-20 education system. This Coalition will leverage existing and new resources that can be applied to advancing Missouri's METS agenda and its long-term objectives. The METS Coalition will keep in the forefront of its work the most important stakeholders who are Missouri's students and families.

The METS Coalition is envisioned to be a not-for-profit organization and will secure Missouri's membership in the National Association of State Science and Mathematics Coalitions (NASSMC). The Missouri Chamber of Commerce and Industry (Missouri

Chamber) in Jefferson City, Missouri has agreed to provide initial space to house this organization.

In addition to the establishment of the METS Coalition, this report also outlines direct ways to address the strategic challenges raised at the Summit and subsequent meetings and offers recommendations and related action plans.

## STRATEGY 1

### Improve the performance of all P-20 (Pre-K, K-12, HE) students.

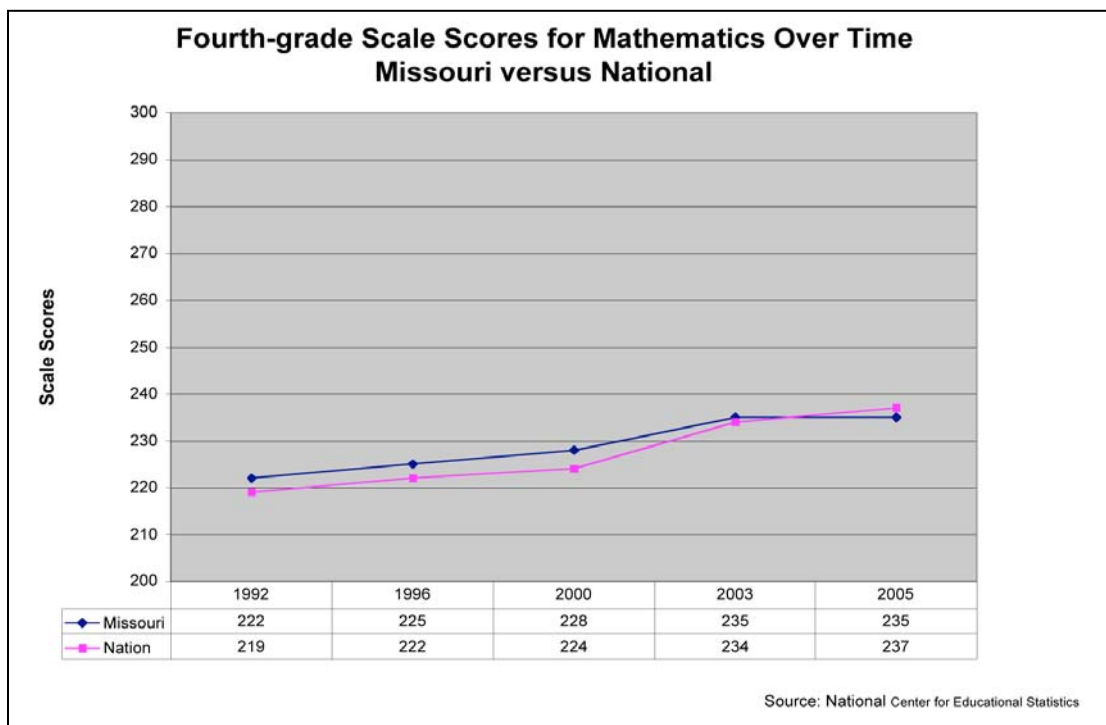
Missouri data mirrors United States statistics which indicate that students, specifically in middle school and high school, are under-performing in METS areas compared to their peers in a variety of developed countries. Missouri's colleges and universities are not graduating sufficient numbers of students with METS degrees.

At the same time, in reviewing the reasons for student under-performance in Missouri, the METS Alliance determined that the Missouri mathematics and science curriculum, GLEs and assessments have not met the internationally benchmarked levels of quality and did not allow for the level of inquiry-based learning that is necessary to provide students with a knowledge base that allows them to compete on a global basis. College-level entry requirements in METS are not articulated so that curriculum can be aligned across the higher education system.

*"We have let the status quo persist for too long and have allowed an entire generation of young people to graduate from high school many of them unprepared through their education to be successful members of the workforce they enter let alone the workforce of the future."*

Governor Matt Blunt

### Missouri 4th Graders have made gains in math since the early 1990s, but rank in the bottom third nationally





### **Recommendation 1: Improve METS curricula and assessments.**

Revise Missouri's K-12 GLEs and assessments for mathematics and science to support focused, inquiry-based instruction modeled on internationally recognized best practices. Ensure that collegiate-level METS curricula follows the same focused, inquiry-based instruction.

Ensure that the curricula, assessments and data systems of K-12 and higher education are articulated and well-aligned.

#### **Action Plan:**

- The METS Coalition will secure the services of experts to identify rigorous, internationally recognized, research-based K-12 METS curricula (see tab 7). These experts will work with the P-20 Council, (RSMo. §160.730, see tab 8). The goal of this work will be the identification of high-quality curricula options that align with and enhance GLEs and assessments. The target date for completion of identification of curricula is October 2007 with initial implementation in schools September 2008.
- The METS Coalition will secure the services of experts to work with The Missouri Department of Higher Education (MDHE) and institutions of higher education (IHEs) to develop state-level policy guidelines for entry-level, collegiate METS curricula and related assessments for access to collegiate-level course work. The target date for completion of guidelines is October 2007 while initial implementation in colleges and universities is September 2008.
- The Department of Elementary and Secondary Education (DESE) and MDHE will appoint a task force comprised of P-20 educators, community members, parents, school boards and school administrators to create strategies for P-20 students to take high-level mathematics and science courses. The task force will work in cooperation with state-level education associations to accomplish this on an on-going basis.
- The P-20 Council will oversee the development and implementation of integrated P-20 data systems. This will be in cooperation with the P-20 Education Data and Research Center Task Force and will follow its timelines.
- The METS Coalition will establish a METS Community Network, comprised of chambers of commerce, stakeholders, business, local colleges and universities to work with schools in identifying resources needed to implement applicable programs that support the revised curricula and activities by December 2007.

**Recommendation 2: Increase rigor in collegiate-level courses.**

Enhance rigor of collegiate-level science and mathematics coursework by expanding Advanced Placement (AP) courses, International Baccalaureate (IB) programs, dual enrollment and dual-degree programs offered to secondary students and provide incentives for students completing more rigorous coursework.

**Action Plan:**

- DESE and MDHE will ensure that AP courses, IB programs, dual enrollment and dual-degree programs are available throughout Missouri on-site or through virtual offerings by June 2007.
- The METS Coalition will provide ideas to the METS Community Network for incentives to increase enrollment in AP courses and IB programs by June 2007.

## STRATEGY 2

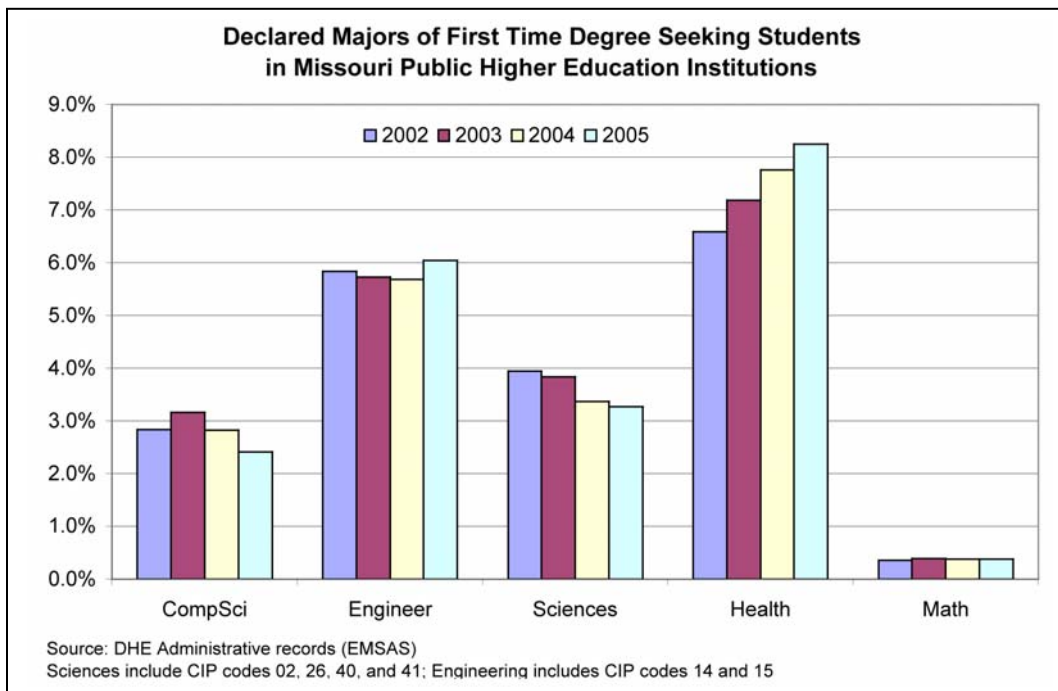
### Expand the pool of students motivated to pursue METS careers.

As Missouri continues to move toward leveraging its biotechnology, plant and animal sciences assets to create new business enterprises and to support, strengthen and advance its well-established advanced manufacturing base, there will be increasing demand for a technically-competent METS workforce. Expanding the pool of students motivated to pursue METS careers is critical to provide the necessary, highly trained workforce.

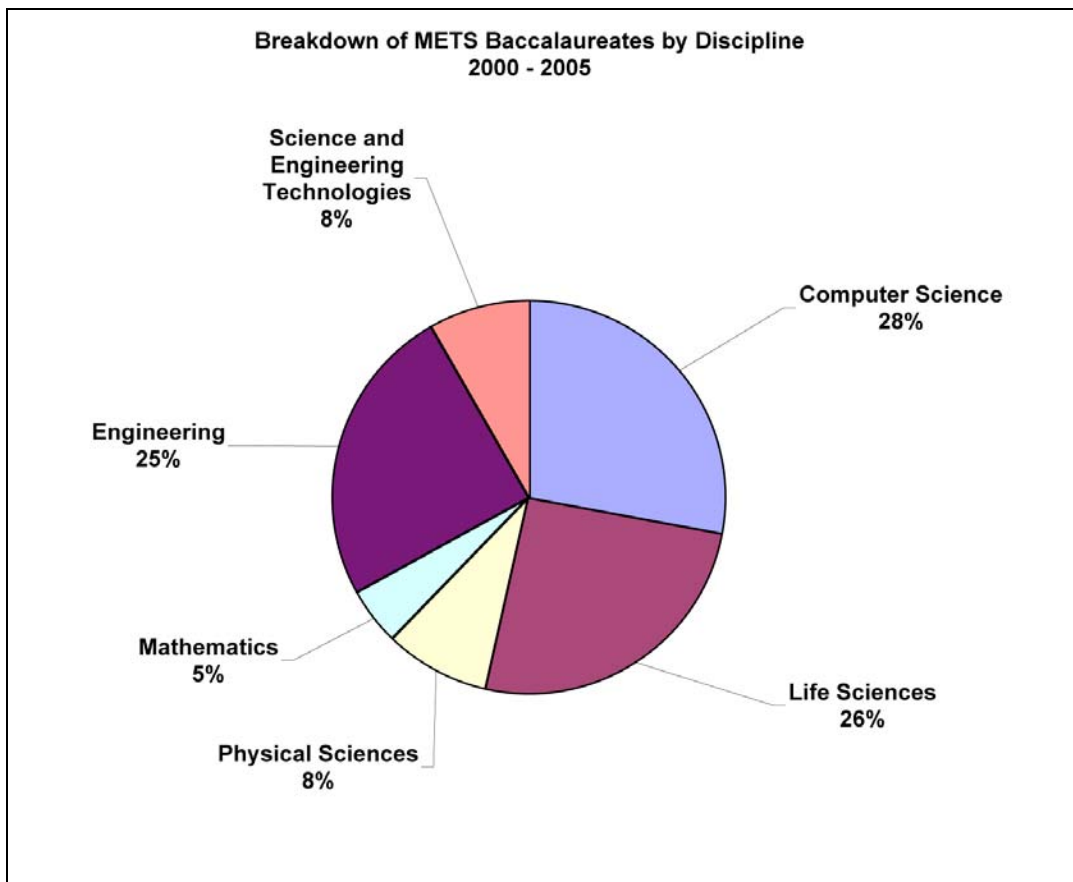
*"It is really a very serious situation and we are committed to helping develop that engineer or scientist of the future, not just for The Boeing Company, but for the entire State of Missouri."*

Jim Young, Vice President of Engineering  
The Boeing Company, St. Louis

### The proportion of first time college students indicating they will major in a METS field is only around 20% and much less if health fields are not included.



**Missouri has produced about 4,600 baccalaureate degrees annually in METS since 2000**



**Recommendation 1: Improve career education and counseling.**

Make students aware of METS career opportunities and ensure they have the academic preparation in METS and non-METS curriculum as well as career counseling at all levels of the education system to successfully pursue METS careers.

**Action Plan:**

- The P-20 Council, DESE and MDHE will review existing career pathways, implement strategies to develop and expand new courses of study that lead to METS career pathways beginning in middle school, continuing to high school and beyond by December 2008.
- The METS Coalition will coordinate with the METS Community Network (see strategy 1, recommendation 1, action plan) to support METS career exploration opportunities for students, teachers and counselors at K-12 and at Missouri colleges and universities by December 2007.

**Recommendation 2: Expose students to “real-world” METS applications.**

Provide students with exposure to and experience in “real-world” METS applications through partnerships with METS businesses, museums, internships, zoos, labs and other opportunities to learn about METS careers and the prerequisites for pursuing a METS career.

**Action Plan:**

- The METS Coalition and METS Community Network will develop a web based portal (see strategy 4, recommendation 4) that provides an evaluated list of METS programs to support the revised GLEs and assessments by December 2007.
- The METS Coalition and METS Community Network, in partnership with private foundations and individual philanthropists, will provide funding to low and middle-income students to participate in summer workshops and afterschool activities designed to expose and generate interest in METS.

**Recommendation 3: Celebrate and reward students who reach certain levels of achievement in METS-related studies and activities.**

Provide incentives to motivate students, parents and schools to pursue METS-related higher education programs.

**Action Plan:**

- The METS Coalition will coordinate with the Missouri Chamber, Coordinating Board of Higher Education (CBHE), DESE, and METS Community Network to develop and support programs recognizing METS achievements by students in the P-20 system by October 2007.
- The METS Coalition will support the efforts of public agencies, financial institutions and private foundations as they work to increase the number of low-interest loans and grants to students who pursue undergraduate and graduate degrees in METS fields by August 2007.
- IHEs will work with MOHELA to implement loan forgiveness programs for students who pursue pre-engineering programs at colleges and universities.
- Review existing Missouri scholarship programs and enhance or create new programs to produce an incentive for students to pursue METS degrees. This analysis should result in the establishment of The METS Scholars program by August 2007.
- The State of Missouri will create an initial incentive fund to reward the state’s public higher education institutions that increase the number of students

graduating with METS-related degrees by at least five percent, starting with the graduating class of 2010.

- MDHE and universities will work with the P-20 Council to develop a plan for creating METS endowed chairs to be used by Missouri's public universities to attract outstanding scholars in the METS fields with a focus on strengthening and increasing the universities' abilities to attract and graduate candidates for masters and doctorates in METS fields by August 2007.
- MDHE will work with universities and community colleges to develop a plan for creating opportunities at Missouri's community colleges to establish a METS visiting faculty program for university faculty who will focus on initiating, strengthening and increasing undergraduate METS-related research opportunities for community college students by August 2007.



### STRATEGY 3

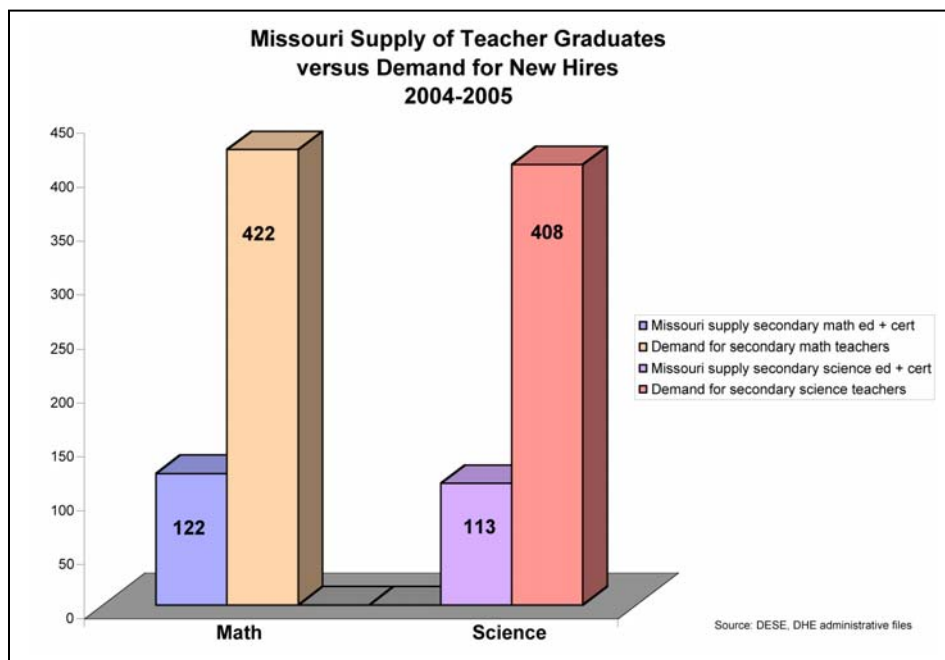
#### Expand the pool of Missouri's quality P-20 METS educators.

**Missouri faces a shortage of METS educators. Addressing this challenge will require a cooperative effort among the state, higher education, school districts and businesses resulting in strategies to ensure that new and practicing educators are equipped to meet the needs for a high-quality METS work force.**

*"Missouri educators are fully aware, sometimes painfully aware, of the obstacles and challenges we face in preparing our youth for a successful future. We are more than willing and ready to form beneficial partnerships, simplify and align a coherent curriculum, and increase our skills to utilize current resources in order to move forward in our primary purpose – providing the best for the future of our students."*

Russell Grammer, Teacher  
Cape Girardeau Public Schools

#### Pre-service METS teacher production does not meet supply



#### Recommendation 1: Improve quality and supply of P-20 METS educators.

Provide innovative approaches for addressing a mathematics and science trained P-12 teaching shortage, while also developing creative programs with the METS Community Network that will excite current METS teaching professionals.

### Action Plan:

- DESE and MDHE will develop a plan that attracts and retains quality mathematics and science teachers in every P-12 Missouri classroom to be implemented by September 2009. The plan should include recommended changes to existing pre-service requirements, options for alternative certification, an adjunct teacher corps, continuing education requirements and other related issues.
- DESE and MDHE will evaluate data from P-20 METS programs to identify and disseminate “pockets of excellence and best practices” throughout Missouri. Information from the evaluation will be used by the Missouri METS Coalition, DESE, and MDHE to develop focused strategies for the Regional Professional Development Centers (RPDCs) and other professional development providers to deliver research-based intensive, sustained professional development programs that include in-classroom support for P-20 METS educators. A progress report is due by June 2007 with completion of the plan expected by June 2008.
- The METS Coalition will devise a plan to form mutually beneficial partnerships between educators and businesses to provide genuine field experiences in educational and work environments.
- The METS Coalition will support expanding programs such as **UTEACH** and **Teach for America** in high-need areas of the State by September 2007.

### Recommendation 2: *Provide incentives to recruit and retain high-quality P-20 METS educators.*

Creative incentive programs are needed to encourage high-quality pre-school through graduate educators to teach METS courses.

### Action Plan:

- The METS Coalition will develop model financial incentives (e.g., loan forgiveness, awards, Continuing Education Units (CEUs) bonuses, sabbaticals, summer pay) for practicing METS educators who upgrade their skills and knowledge in METS areas as well as those in hard-to-staff P-20 schools and make recommendations to the P-20 Council by December 2007.
- The METS Coalition will develop a Missouri METS P-20 Educator of the Year Awards program for implementation during the 2008-2009 school year.

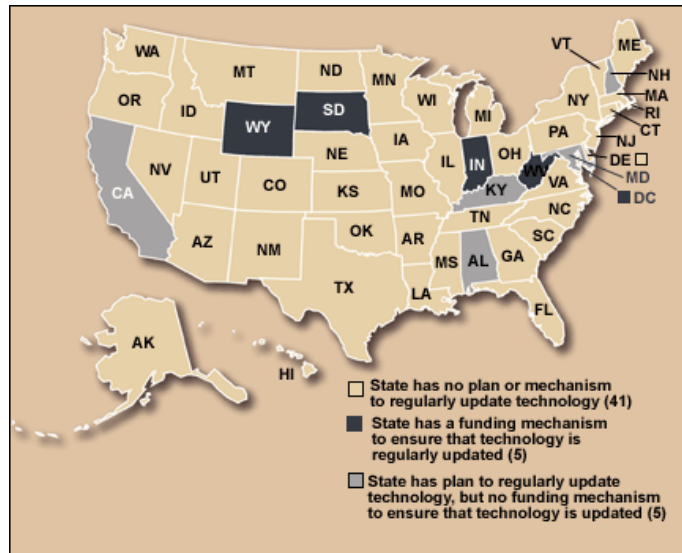
**Establish a technology plan to support METS curricula, GLEs and assessments in Missouri.**

Greg Steinhoff, Director  
Missouri Department of Economic Development

## Technology coursework and state standards across the United States



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**Recommendation 1: Secure Instructional Technology Facilitators (ITFs) to work with METS educators.**

Schools need a central point of contact to assist in finding resources needed to bring technology to the classroom and ensure that it is used as an effective tool for teaching.

**Action Plan:**

- The P-20 Council will develop a plan to ensure that every school, school district and institution of higher education (IHE) will have a teacher trained as an ITF for every 50 METS educators by 2010.
- ITFs will communicate, facilitate and coordinate maximum utilization of technology in P-20 teaching and learning environments to ensure the successful participation of educators and students in METS initiatives.

**Recommendation 2: Develop a standard suite of technology and curriculum resources for METS.**

Students need to have a high level of technology expertise and skills to compete in a global economy. Technology in the classroom also improves student learning; therefore, securing these tools is essential.

**Action Plan:**

- The METS Coalition, DESE, MDHE, individual school districts and IHEs will ensure that all P-20 METS educators and students have the appropriate educational technology and curriculum resources starting in 2010 and that technology is upgraded on a planned basis.

**Recommendation 3: Develop focused professional development to provide all P-20 METS educators with an improved base of teaching methods integrated with age-appropriate content knowledge to engage and motivate students, as recommended in the METS strategies.**

Strong professional development programs with proven results should be used to ensure teachers have technology expertise to maximize teaching effectiveness.

**Action Plan:**

- The METS Coalition, DESE, and MDHE will adopt the **eMINTS** (see tab 9) instructional model (inquiry-based teaching powered by technology). The eMINTS instructional model and other effective programs will be incorporated as a foundation for professional development by 2010.

**Recommendation 4: Develop and maintain a web based METS portal.**

Missouri educators need a central web site to find METS resources and best practices.

**Action Plan:**

- The METS Coalition, MDHE, and DESE will secure funding for the necessary technology and personnel to create and maintain the METS portal by September 2007.
  - The METS portal will provide all Missouri educators and students with current accurate curriculum and assessment materials and a cache of high-quality online instructional resources.

## STRATEGY 5

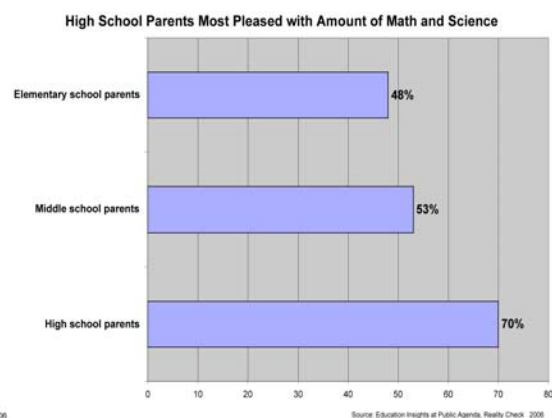
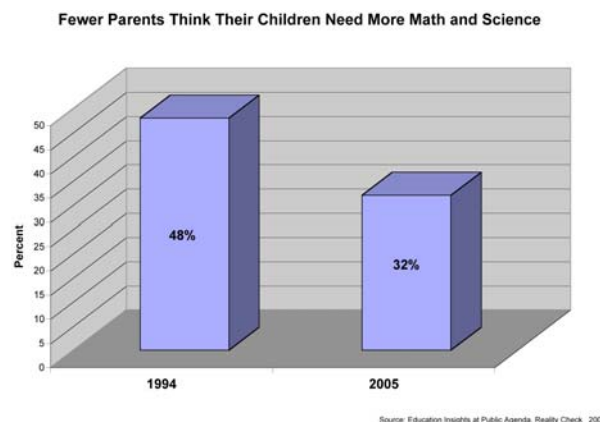
Increase public awareness of the value of METS knowledge on the lives of all Missourians and highlight the importance of METS-related industries and jobs to enhance Missouri's global competitiveness and innovation.

The education of Missouri citizenry in the areas of METS is important on many different levels. First, METS-based industry and businesses improve lifestyles through careers and job opportunities that provide higher incomes. Second, METS education ensures that Missourians have the knowledge and skills necessary to compete in the new global economy. Finally, METS-related industries stimulate the creation of new knowledge; allowing Missourians to be leaders in innovation, especially in the areas of plant, animal and life sciences, advanced manufacturing and information technologies. Therefore, it is important that Missouri's citizens, parents, educators, and businesses are engaged and advocate for changes that will improve METS educational opportunities for all students and our workforce.

*"Competing with mediocrity won't get Missouri very far. Missouri could become a state in which all students are held to high achievement standards, are provided with the resources and instruction they need to learn and meet ambitious goals for their achievement. Few would argue against this goal, but what would it look like in Missouri?"*

Deborah Patterson, President  
Monsanto Fund

*There is a lack of parental pressure to raise the K-12 bar in math and science*





**Recommendation 1: Create and implement a public awareness campaign. (see tab 9)**

The METS Coalition will identify and communicate the importance of METS to key stakeholders and develop a long-term strategy to sustain that message.

**Action Plan:**

- The METS Coalition will develop a comprehensive communications plan, with strategies that define success and demonstrate the necessity for change across the state by December 2006.
- The METS Coalition will engage a public relations firm to create a campaign to highlight Missouri's future in METS industries, encourage students to take rigorous courses and enter fields focused on METS.

## Conclusion

As globalization becomes an increasingly prominent feature of our time, it is critical that Missouri addresses mathematics, engineering, technology and science education. The METS Alliance believes this strategic plan will begin the process of improving the way we deliver mathematics and science to our students in Missouri. Mathematics skills alone matter in half of all occupations and science skills are important in a quarter of all occupations. (Source: MERIC)

This report outlines the steps necessary to implement new ideas to position Missouri as a leader in our global economy. We believe this is possible by establishing the collaborative partnerships identified in this report. As Governor Blunt said, “We are facing a challenge in education and it is only through a collaborative effort among all integral partners that will achieve the results our children deserve.” The METS Alliance will partner with Governor Blunt, business, education, government and communities to move these issues forward.

There is a sense of urgency behind this initiative because our economic future depends on the quality of education in Missouri. Indeed, the economic well-being of individuals and communities in which they live are enhanced when its citizens have a critical level of education in METS disciplines. Our increasingly complex and sophisticated technology-based economy demands that citizens and consumers be technologically and scientifically savvy.

The METS Alliance believes Missouri’s education and economic systems hold great promise. We believe this strategic plan is the starting point to improve METS education in Missouri. We welcome the opportunity to partner with Missourians to move this state forward and secure our economic future.

## **METS Alliance Meeting Presenters**

*The Alliance extends its appreciation to the following presenters for sharing their knowledge and expertise with members during the creation of this report.*

### **June 29, 2006**

Monica Beglau, eMINTS National Center

### **July 19, 2006**

Monica Beglau, eMINTS National Center

Charles Toulmin, National Governor's Association

Ryan McClure, Fleishman Hillard

### **July 27, 2006**

David Lineberry, Missouri School Board Association

### **August 18, 2006**

Dr. Susan Everson, St. Louis University

Janna Gordanier, Ozark Rural Systemic Initiative

Darl Davis, Director of Region 4 – Northeast RPDC

## **Missouri METS Alliance Meetings**

### **Wednesday, June 14**

**Missouri Chamber of Commerce and Industry  
428 East Capitol Avenue  
Jefferson City, MO**

### **Monday, June 29**

**Missouri Chamber of Commerce and Industry  
428 East Capitol Avenue  
Jefferson City, MO**

### **Thursday, July 19**

**Missouri Chamber of Commerce and Industry  
428 East Capitol Avenue  
Jefferson City, MO**

### **Thursday, July 27**

**Missouri Chamber of Commerce and Industry  
428 East Capitol Avenue  
Jefferson City, MO**

### **Thursday, August 18**

**Missouri Chamber of Commerce and Industry  
428 East Capitol Avenue  
Jefferson City, MO**

### **Thursday, August 24**

**Missouri Chamber of Commerce and Industry  
428 East Capitol Avenue  
Jefferson City, MO**

## Research-Based Mathematics and Science Curricula

The National Science Foundation (NSF) is an independent federal agency created by Congress in 1950 “to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense...” With an annual budget of about \$5.5 billion, NSF is the funding source for approximately 20 percent of all federally supported basic research conducted by America’s colleges and universities. In many fields such as mathematics, computer science and the social sciences, NSF is the major source of federal backing.

NSF has spent many years and funded many projects that have provided significant research on the best curricula and materials for teaching mathematics and science. The organization has also funded both Mathematics and Science Education Implementation and Dissemination Centers. The University of Missouri-Columbia hosts the Show-Me Center, an internationally recognized resource in mathematics education <http://www.showmecenter.missouri.edu> .

The Education Implementation and Dissemination Centers work in partnership with academic institutions, corporations, educational organizations and school districts to meet the following goals:

- Enhance student learning in science and mathematics
- Base implementation and dissemination activities on research and the use of “best practices”
- Leverage resources to sustain the implementation of inquiry-based science and mathematics curriculum programs with all students in local school districts.

A listing of the K-12 “Research-Based Science and Mathematics Core Curriculum Programs” recommended by NSF is available from any of the Implementation and Dissemination Centers along with the guidance needed to help schools and districts make appropriate curriculum choices from among the recommended programs.

SECOND REGULAR SESSION  
[TRULY AGREED TO AND FINALLY PASSED]  
SENATE COMMITTEE SUBSTITUTE FOR

# SENATE BILL NO. 580

93RD GENERAL ASSEMBLY  
2006

3126S.02T

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## AN ACT

To amend chapter 160, RSMo, by adding thereto one new section relating to the creation of a more effective education system.

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*Be it enacted by the General Assembly of the State of Missouri, as follows:*

Section A. Chapter 160, RSMo, is amended by adding thereto one new  
2 section, to be known as section 160.730, to read as follows:

160.730. 1. Not less than twice each calendar year, the  
2 commissioner of higher education, the chair of the coordinating board  
3 for higher education, the commissioner of education, the president of  
4 the state board of education, and the director of the department of  
5 economic development shall meet and discuss ways in which their  
6 respective departments may collaborate to achieve the policy goals as  
7 outlined in this section.

8 2. In order to create a more efficient and effective education  
9 system that more adequately prepares students for the challenges of  
10 entering the workforce, the persons and agencies outlined in subsection  
11 1 of this section shall be responsible for accomplishing the following  
12 goals:

13 (1) Studying the potential for a state-coordinated  
14 economic/educational policy that addresses all levels of education;

15 (2) Determining where obstacles make state support of programs  
16 that cross institutional or jurisdictional boundaries difficult and  
17 suggesting remedies;

18 (3) Creating programs that:

19 (a) Intervene at known critical transition points, such as middle  
20 school to high school and the freshman year of college to help assure  
21 student success at the next level;



22           (b) Foster higher education faculty spending time in elementary  
23 and secondary classrooms and private workplaces, and elementary and  
24 secondary faculty spending time in general education-level higher  
25 education courses and private workplaces, with particular emphasis on  
26 secondary school faculty working with general education higher  
27 education faculty;

28           (c) Allow education stakeholders to collaborate with members of  
29 business and industry to foster policy alignment, professional  
30 interaction, and information systems across sectors;

31           (d) Regularly provide feedback to schools, colleges, and  
32 employers concerning the number of students requiring postsecondary  
33 remediation, whether in educational institutions or the workplace;

34           (4) Exploring ways to better align academic content, particularly  
35 between secondary school and first-year courses at public colleges and  
36 universities, which may include alignment between:

37           (a) Elementary and secondary assessments and public college  
38 and university admission and placement standards; and

39           (b) Articulation agreements of programs across sectors and  
40 educational levels;

41           3. No later than the first Wednesday after the first Monday of  
42 January each year, the persons outlined in subsection 1 of this section  
43 shall report jointly to the general assembly and to the governor the  
44 actions taken by their agencies and their recommendations for policy  
45 initiatives and legislative alterations to achieve the policy goals as  
46 outlined in this section.

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**eMINTS (enhancing Missouri's Instructional Networked Teaching Strategies)** is truly a Missouri success story. eMINTS started as a small pilot project funded by a grant in 13 St. Louis area classrooms in 1997. The Missouri Department of Elementary and Secondary Education (DESE), the University of Missouri (UM), and the Missouri Department of Higher Education (MDHE) have partnered in the development and implementation of eMINTS since its beginning. Student test scores in pilot classrooms were much higher than in other classrooms in pilot districts. DESE, UM and MDHE took steps to expand eMINTS to other schools state-wide using a combination of state and local resources. eMINTS now serves over 20,000 Missouri students in over 500 Missouri schools (grades 3 – 12); however, with recent state and federal funding cuts, *fewer than 1 in 15 schools that want eMINTS classrooms can obtain them*. Schools are literally standing in line hoping to find funds to implement eMINTS classrooms.

### **eMINTS Produces Results**

Evaluation of eMINTS over the past six years has consistently shown very positive results in student performance on state tests (language arts, mathematics, science and social studies) and in changes to teaching practices. Comparisons of test scores for students enrolled in eMINTS classrooms with students not enrolled in eMINTS classrooms have produced statistically significant differences each year. Observations of eMINTS teachers show greater use of inquiry-based teaching methods supported by technology when compared to teachers who have not participated in eMINTS professional development. Teachers and principals in eMINTS schools report higher levels of student motivation and better school attendance for eMINTS students.

### **Components and Costs of eMINTS**

The following components set eMINTS apart from other educational programs:

1. Intensive, sustained professional development with in-classroom coaching to teach teachers how to use inquiry-based strategies and technology resources specific to their district's curriculum.
2. A standard suite of technology resources to support teaching and learning:
  - a. SMART Board and projector, teacher laptop, student computers (1 for every 2 students), digital camera, and printer.
  - b. Microsoft Office, concept-mapping software, multi-media editing software
3. Continuous evaluation to ensure that program goals are being met

The average cost for all components in the implementation of an eMINTS classroom is \$25,000. Schools have funded eMINTS classrooms through many sources including state and federal grants, private foundation support, donations from local businesses, bond issues, reprioritization of local resources, and parent-teacher group fund-raising efforts.

### **eMINTS in Other States**

In 2004, other states began learning about eMINTS and started replicating the program in their schools. The eMINTS National Center was created to support out-of-state replications and to ensure program integrity. eMINTS is being implemented in Utah, Maine, Illinois, Ohio, Arkansas, and Nevada. Student test results from Utah show that students in Utah eMINTS classrooms also achieve at higher levels on state tests (language arts, science and mathematics) when compared with students who are not in eMINTS classrooms.

*The eMINTS National Center is based at the University of Missouri (UM) and is a collaborative program developed by UM, the Missouri Department of Elementary and Secondary Education and the Missouri Department of Higher Education. Contact the Center at 573-884-7202 or at [emints-info@emints.org](mailto:emints-info@emints.org).*

# Missouri Alliance on Mathematics Engineering Technology and Science

## 2006 Communications Plan

### Objectives

- Support METS Alliance report with effective communications to inform audiences.
- Communicate Governor Blunt's commitment to making Missouri a leader in METS.
- Develop ongoing articles that highlight successes in METS.
- Identify outstanding business, legislative, and community leaders who work in METS-related areas and feature them in articles.
- Develop network of these local leaders that are willing to be available to the media for comment on METS.
- Inform school boards of the importance of METS using local leaders, Summit attendees and Alliance members.

### Audience

- Legislators
- Local elected officials
- Business leaders in Missouri
- Chancellors of colleges, universities
- Deans, professors, teachers
- State Board of Education
- Coordinating Board for Higher Education
- Department of Elementary and Secondary Education
- Education Associations
- Parents
- Teachers
- Employees
- Students
- General Public

### Challenges

Communication needs to convey messages that will eventually make METS important to key business, students, educators, community and elected leaders. Information also needs to be tailored to reflect regional sensitivities and issues.

## Strategies

- Communicate why METS is important to Missouri's economy, competitiveness and quality of life.
- Identify and communicate successful METS programs, individuals, and businesses in stories across Missouri.
- Identify individuals who attended the METS Summit that can help bring local importance to this issue.
- Illustrate how skills in METS improve the economic future for the person, business, city and state.
- Explain where Missouri is at this time and what our goal is going forward. Offer data points that show the crisis situation that Missouri children face in regard to math and science proficiency.
- Outline key steps we can take as a state to improve our METS status and reach our goal.
- Identify how Missourians can support these efforts and issue a call to action.
- Focus on Missouri businesses.
- Educate the public on METS being part of P-20 education and beyond.

## Key Messages

### **1. METS strengthens our economic well-being.**

#### **Improving Lifestyles (Opportunities provided by METS):**

- Earning power: In general, the earning power of individuals in professions that are heavily dependent on mathematics and science is significantly higher than in other professions.
- Economic well-being: The economic well-being of individuals and communities in which they live are enhanced when its citizens have a critical level of education in METS disciplines.
- Educated consumers: The increasingly complex/sophisticated technology-based economy demands that the citizens be equally technologically and scientifically savvy.

### **2. Missouri's Crisis Situation**

- Despite notable pockets of excellence, a vast majority of Missouri's students are not showing foundational math and science skills. For example, in 2005 only 17 percent of Missouri's 10<sup>th</sup> grade students scored at proficient or advanced in **mathematics**. Only eight percent tested at proficient or advanced in **science**.
- Due to this, the need for post-secondary remediation in math has increased significantly in recent years. In 2004, more than 30 percent of first-time freshman were enrolled in remedial math classes at Missouri public institutions.

### **3. METS improves our ability to complete globally.**

#### **Gaining and Maintaining the Global Competitive Edge:**

- “To an extraordinary degree, our nation's fate depends on maintaining our world leadership in science and technology. Our superpower status is tied to it. Productivity gains that our economy needs to improve our standard of living and competitiveness depends on it. The appeal of our colleges to the rest of the world flows largely from it.” – [Daniel Yankelovich in The Chronicle of Higher Education, November 25, 2005.](#)
- “For anyone concerned about strengthening America's long-term leadership in science and technology, the nation's schools are an obvious place to start. But brace yourself for what you'll find. The depressing reality is that when it comes to educating the next generation in these subjects, America is no longer a world contender. In fact, U.S. students have fallen far behind their competitors in much of Western Europe and in advanced Asian nations like Japan and South Korea.” – [Business Week Online, March 16, 2004.](#)

### **4. METS creates opportunity.**

- Our current advancement in technology and modernity has come, in large part, from research in basic science and mathematics the creation and discovery of new knowledge. Missouri research institutions have a huge role to play in this respect. Basic research requires a workforce prepared and skilled in science and mathematics at all levels (from technical certificates to associates degrees to bachelor's degrees to master's degrees and doctoral degrees).

#### **Tactics**

#### **Materials**

Provide local spokespersons with packets that will include:

- Talking Points
- Editorials
- Data Points
- Clips

#### **News Releases**

- Coordinate with the Governor's Office communications person to produce the following:
- Announce METS Alliance report and highlight the portions the Governor wishes to support. Send specific releases to education organizations for publication.

- Follow up with a more specific release on current Missouri METS situation and where we should be in the future.
- Begin identifying positive METS stories and placing them in key newspapers across Missouri throughout the year.
- Issue a release whenever a significant METS advancement is made in Missouri.

### Articles

- Identify key business, community, and elected leaders to write articles outlining the importance of METS.
- Utilize the Missouri Chamber's network of local chambers to have op-eds and letters to the editor sent to local papers from respected community spokespeople.
- Work with reporters to produce feature stories on outstanding students in METS.
- Highlight new/improved METS programs at colleges/universities and how these programs will improve the economic future of Missouri.

### Business, Educator, Student Recruitment Pitches

- Identify new incubators, small or new businesses attracted or retained in Missouri because of our focus on METS.
- Focus on new professors, teachers who were attracted or retained in Missouri because we accomplished a METS priority.

### Results Pitches

- Measure our METS improvement and release these results periodically.
- Identify key schools, colleges and universities that have excelled in METS and share these results.

### Speaking Opportunities

- Request Governor Blunt focus on METS Alliance messages in speeches. Tie economic development, education results and advancements to Missouri's focus on METS.
- Request key education department executives focus on METS key messages in their speeches.

- Request METS Alliance leaders mention METS key messages in their speeches.
- Encourage individuals that attended the METS Summit to host local meetings in their areas explaining the importance of METS. This would follow the initial media push to continue the movement of public awareness.
- Identify conferences/meetings where METS Alliance key messages can be presented.

### Statewide Meetings

- When the Missouri METS Alliance agenda is established, ask Governor Blunt, key education, business, and legislative leaders to conduct a “statewide tour” to announce our objectives. Possible locations include: Kansas City, Springfield, Cape Girardeau, Columbia and St. Louis. In each city, the specific educator, business and legislative leaders will be present and add to the Governor’s message.
- Time allowing, Governor Blunt could conduct 15-30 minute interviews with television stations in the four major media markets in Missouri (Kansas City, St. Louis, Springfield, Jefferson City/Columbia).

### Web Site

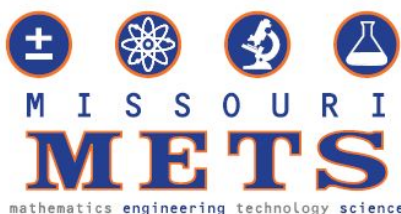
- Create or revise existing METS Web site to be a clearing house for information and statistics regarding METS. The site can be a place where supporters go to download fact sheets or presentations they can use in their communities.

### Editorial Board or Publisher Meetings

- Governor Blunt or METS leaders should meet twice a year with editorial/publishers of Missouri’s key newspapers, *Kansas City Star/Business Journal*, *St. Louis Post Dispatch/Business Journal*, *Springfield News Leader*, *Southeast Missourian*, etc. to discuss our objectives and progress on achieving them.

### Identify Media Sponsors in Key Markets

- The METS Coalition will identify a key television, radio and print outlet in each major Missouri market. Next, we need to request opportunities to place public service announcements on METS throughout the year. (They could begin a program featuring students, teachers and business leaders who are advocates for METS or have achieved outstanding results related to METS.)



## Missouri Alliance on Math, Engineering, Technology, and Science Education

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Studies indicate that American fourth grade students score high in math and science when compared to their global peers, but by twelfth grade our students score at the bottom. Missouri students mirror this statistic which leaves many of our students losing interest in these subjects and less prepared to enter the global workforce. To address this challenge, Governor Blunt started the Missouri Alliance on Math, Engineering, Technology, and Science (METS), which is dedicated to suggesting ways our state can help stress the importance of these subjects to the future success of our young people and our state's economy.

### What can METS do for Missouri?

#### **METS Strengthens our economic well-being**

- Earning Power: On average, recent METS college graduates earn 18% more than their counterparts in non-METS fields.<sup>1</sup>
- Job Force: In life sciences alone, 2,100 firms employ 183,000 Missourians.<sup>2</sup>
- Economic well-being: METS based industries accounted for three-quarters of Missouri's \$10.6 billion in products and services exported in 2005.<sup>3</sup>

#### **METS Addresses Missouri's Crisis Situation**

- A majority of Missouri's students do not possess a basic knowledge level in math and science.
  - Missouri 4<sup>th</sup> grade students' math skills rank in the bottom third nationally.<sup>4</sup>
  - Math scores of 8<sup>th</sup> grade students have declined in national assessments, ranking Missouri below 34 other states.<sup>5</sup>
  - In 2005 only 17 percent of Missouri's 10<sup>th</sup> grade students scored at proficient or advanced in math. Only eight percent tested at proficient or advanced in science.<sup>6</sup>
- As a result, the need for post-secondary remediation in math has increased significantly in recent years. In 2004, more than 30 percent of first-time college freshman were enrolled in remedial math classes at Missouri public institutions.<sup>7</sup>

#### **METS improves our ability to compete globally**

- The U.S. Talent Pool: American students earn proportionately fewer degrees in METS than students in other industrialized nations.<sup>8</sup>
- "For anyone concerned about strengthening America's long-term leadership in science and technology, the nation's schools are an obvious place to start. But brace yourself for what you'll find. The depressing reality is that when it comes to educating the next generation in these subjects, America is no longer a world contender. In fact, U.S. students have fallen far behind their competitors in much of Western Europe and in Advanced Asian nations like Japan and South Korea."
- *—BusinessWeek Online, March 16, 2004*

#### **METS creates opportunity for Missourians**

- Our current advancement in technology and modernity has come, in large part, from the creation and discovery of new knowledge. Missouri institutions have a huge role to play in this respect. The creation and discovery of new knowledge requires a workforce prepared and skilled in science and mathematics at all levels.

1 DHE Administrative records (EMSAS) and DOLIR Wage Records (Quarter 2, 2005)

2 MERIC, Missouri Life Science 2004

3 WISER and MERIC

4 National Center for Educational Statistics

5 National Center for Educational Statistics

6 DESE School Accountability Report Card, 2005

7 MERIC analysis of Missouri Dept. of Higher Education, EMAS Data

8 DHE Administrative records (EMSAS) and DOLIR Wage Records (Quarter 2, 2005)



## Missouri METS Alliance Timeline

This timeline has been prepared with a desire for action. We understand that the task owners may have several items due at the same time. We realize these dates may need to be adjusted as they move through the process.

Task #	Task Description	Task Owner	Funding Source	Due Date
<b>STRATEGIC CHALLENGE # 1: Improve the performance of all P-20 (Pre-K, K-12, HE) students.</b>				
<b>RECOMMENDATION 1: Improve METS curricula and assessments.</b>				
1	Secure the services experts to identify high-quality curricula that align with and enhance Missouri's Grade Level Expectations (GLEs) and assessments.	METS Coalition		
1a	Identification of curricula with GLE's and assessments.	METS Coalition		Oct-07
1b	Initial implementation in schools.	METS Coalition		Sep-08
2	Secure the services of experts to work with MDHE and IHEs to develop state-level policy guidelines for entry-level collegiate METS curricula and related assessments for access to collegiate-level course work.	METS Coalition		
2a	Guidelines complete.	METS Coalition		Oct-07
2b	Initial implementation in colleges and universities.	METS Coalition		Sep-08
3	Appoint a Task Force to create strategies to encourage P-20 students to take high level math and science courses.	DESE, MDHE		On-going

Task #	Task Description	Task Owner	Funding Source	Due Date
4	Ensure the initial implementation of integrated P-20 data systems.	P-20 Council		P-20 Education Data and Research Center Task force timeline
5	Develop METS Network to identify resources needed for implementation of curricula.	METS Coalition		Dec-07
<b><u>RECOMMENDATION 2:</u> Increase rigor in collegiate-level courses.</b>				
1	Ensure AP, IB, dual enrollment and dual degree programs are available throughout Missouri on-site or through virtual offerings.	DESE, MDHE		Jun-07
2	Recommend an incentive program to the P-20 Council that could include a mechanism for increasing enrollment in these courses.	METS Coalition		Jun-07
<b>STRATEGIC CHALLENGE # 2:</b> <b>Expand the pool of students motivated to pursue METS careers.</b>				
<b><u>RECOMMENDATION 1:</u> Improve career education and counseling.</b>				
1	Make students aware of METS career opportunities and ensure they have the academic preparation in METS and non-METS curriculum as well as career counseling at all levels of the education system to successfully pursue METS careers.	DESE, MDHE, state colleges & universities		On-going
2	Review existing career pathways and implement strategies to develop and expand new courses of study that lead to METS career pathways.	P-20 Council, DESE, MDHE		Dec-08

Task #	Task Description	Task Owner	Funding Source	Due Date
3	Establish METS Network to support METS career exploration opportunities.	METS Coalition		Dec-07
<b>RECOMMENDATION 2: Expose students to "real-world" METS applications.</b>				
1	METS Coalition and METS Network will develop a web-based portal (see strategy 4, recommendation 4) that provides an evaluated list of METS programs to support the revised GLEs and assessments.	METS Coalition		Dec-07
2	METS Coalition and METS Network, in partnership with private foundations and individual philanthropists, will provide funding to low and middle income students to participate in summer workshops designed to expose and generate interest in METS.	METS Coalition		On-going
<b>RECOMMENDATION 3: Celebrate and reward students who reach certain levels or achievement in METS-related studies and activities.</b>				
1	Develop and support programs to recognizing METS achievements of P-20 students.	METS Coalition, DESE, METS Network		Oct-07
2	Work with public agencies, financial institutions, and private foundations to increase the number of low-interest loans and grants to students who pursue undergraduate and graduate degrees in METS fields.	METS Coalition		Aug-07
3	Work with MOHELA to implement loan forgiveness programs for students who pursue pre-engineering programs at colleges/universities.	IHE's		On-going
4	Develop a METS Scholars Program.	METS Coalition		Aug-07

<b>Task #</b>	<b>Task Description</b>	<b>Task Owner</b>	<b>Funding Source</b>	<b>Due Date</b>
5	The State of Missouri will create an initial incentive fund to reward the state's public higher education institutions that increase the number of students graduating with METS-related degree's by at least 5% starting with the graduating class of 2010.	State of Missouri		May-10
6	Develop a plan for creating METS endowed chairs to be used by Missouri's public universities to attract outstanding scholars in the METS fields.	MDHE, P-20 Council, IHE's		Aug-07
7	Develop a plan for creating opportunities at Missouri's community colleges to establish a METS visiting faculty program for university faculty who focus on METS related research opportunities.	MDHE, P-20 Council, state colleges & universities		Aug-07
<b>STRATEGIC CHALLENGE # 3:</b>				
<b>Expand the pool of Missouri's quality P-20 METS educators.</b>				
<b>RECOMMENDATION 1: Improve Quality and Supply of P-20 METS Educators.</b>				
1	Develop a plan that provides and retains quality math and science teachers in every P-12 Missouri classroom.	DESE, MDHE		Sep-09
2	Evaluate data from P-20 METS programs to identify and disseminate "pockets of excellence and best practices" throughout Missouri.	DESE, MDHE		On-going
2a	Progress Report .	METS Coalition, DESE, MDHE		Jun-07
2b	Use evaluation data to develop focused strategies for the RPDC and other providers to deliver research-based intensive, sustained professional development programs.			Jun-08

Task #	Task Description	Task Owner	Funding Source	Due Date
3	Devise a plan to form mutually beneficial partnerships between educators and businesses to provide genuine field experiences in educational and work environments	METS Coalition		On-going
4	Support expanding programs such as UTEACH and Teach for America in high-need areas of the State	METS Coalition		Sep-07
<b>RECOMMENDATION 2: Provide incentives to recruit and retain high quality P-20 METS educators.</b>				
1	Provide recommendations to the P-20 Council on financial incentives for practicing METS educators who upgrade their skills and knowledge in METS areas.	METS Coalition		Dec-07
2	Develop a State METS P-20 Educator of the Year Awards program for implementation.			May-08
<b>STRATEGIC CHALLENGE # 4: Establish a technology plan to support METS curricula, GLEs and assessments in Missouri.</b>				
<b>RECOMMENDATION 1: Secure Instructional Technology Facilitator (ITF) to work with METS educators.</b>				
1	Implement a plan to ensure that every school, school district and IHE will have an ITF for every 50 METS educators by 2010.	P-20 Council		Jan-10
2	Communicate, facilitate and coordinate maximum utilization of technology in P-20 teaching and learning environments to ensure the successful participation of educators and students in METS initiatives.	ITFs		On-going

Task #	Task Description	Task Owner	Funding Source	Due Date
	<b><u>RECOMMENDATION 2:</u> Develop a standard suite of technology and curriculum resources for METS.</b>			
1	Ensure that all P-20 METS educators and students have the appropriate educational technology and curriculum resources starting in 2010, and that technology is upgraded on a planned basis.	METS Coalition, DESE, MDHE, state colleges & universities, individual school districts		Jan-10
	<b><u>RECOMMENDATION 3:</u> Develop focused professional development to provide all P-20 METS educators with an improved base of teaching methods integrated with age-appropriate content knowledge to engage and motivate students, as recommended in the METS strategies.</b>			
1	Adopt the eMINTS instructional model.	METS Coalition, DESE, MDHE		Jan-10
	<b><u>RECOMMENDATION 4:</u> Develop and maintain a web based METS portal.</b>			
1	Secure funding for the necessary technology and personnel to create and maintain the METS portal.	METS Coalition, DESE, MDHE		Sep-07

Task #	Task Description	Task Owner	Funding Source	Due Date
<b>STRATEGIC CHALLENGE # 5:</b> <b>Increase public awareness of the value of METS knowledge on the lives of all Missourians and highlight the importance of METS-related industries and jobs to enhance Missouri's global competitiveness and innovation.</b>				
	<b><u>RECOMMENDATION 1:</u> Create and implement a public awareness campaign.</b>			
1	Develop a comprehensive communications plan and strategies that define success that demonstrates the necessity for change across the state.	METS Coalition		Dec-06
2	METS Coalition will engage a PR Firm to create a public campaign to highlight Missouri's future in METS industries, encourage students to take rigorous courses and enter METS-focused fields.	METS Coalition		